Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Request of Progeny LMS, LLC	)	WT Docket No. 12-202
	)	
For Waiver and Extension of Time	)	

REQUESTS FOR WAIVER AND EXTENSION OF TIME

Progeny LMS, LLC ("Progeny"), by its attorneys, hereby requests a wavier and extension of time to complete the process of making wireless handsets that are compatible with its location technology commercially available in the United States. This requirement was imposed by an order issued by the Mobility Division ("*Division*") of the Wireless Telecommunications Bureau on January 17, 2017 ("*Order*").[1]

As indicated in the Progress Report that Progeny concurrently filed with the Commission on a confidential basis, Progeny has made substantial progress in securing the inclusion of its Metropolitan Beacon Service ("MBS") location technology in wireless handsets that will soon be commercially available in the United States. Based on this progress, it can be concluded that, barring unforeseen circumstances, Progeny's MBS location technology will be included in wireless handsets that will be widely available on a commercial basis in the near future. In order to complete this process, Progeny requests that the Commission grant Progeny a waiver and 20 month extension of time to complete the rollout of MBS-compatible handsets.

[1] *See* Request of Progeny LMS, LLC for Waiver and Limited Extension of Time, WT Docket No. 12-202, *Order*, DA 17-20, ¶ 35 (Mob. Div., Jan. 17, 2017) ("*Order*").

The grant of such a waiver and extension is justified for a number of reasons. First, as the Commission is aware, the inclusion of Progeny's MBS technology in wireless handsets involves factors that are entirely beyond Progeny's control. Despite this, Progeny has made substantial progress in securing the inclusion of MBS in wireless handsets.

Second, the grant of a 20 month extension of the MBS-compatible handset condition will still ensure that Progeny's technology will be commercially available in wireless handsets prior to the end of 2020. This will be in advance of the April 2021 deadline for the major wireless carriers to begin providing vertical location information in the top 25 Cellular Market Areas ("CMAs"), which is the first of the deadlines that is expected to require wireless carriers to use Progeny's location service. Therefore, the grant of an extension will not delay the implementation of the Commission's wireless location requirements.

Third, Progeny's MBS technology will provide substantial public interest benefits, including providing highly accurate horizontal indoor location information and providing floor level vertical indoor location information to support E911 emergency services. Progeny's MBS technology can also support emergency first responders using FirstNet. In addition, Progeny's technology is under consideration by the U.S. government as a potential backup to the Global Positioning System ("GPS") in urban areas of the United States. Each of these applications will result in substantial benefits in the form of public health, safety and domestic security.

I. THE INCLUSION OF PROGENY'S MBS TECHNOLOGY IN WIRELESS HANDSETS INVOLVES FACTORS THAT ARE ENTIRELY BEYOND PROGENY'S CONTROL

Pursuant to Section 1.946(e)(1) of the Commission's rules, the Commission may grant an extension of a build out deadline if a licensee shows that its failure to meet the deadline is due to

"causes beyond its control."[2] As the Commission is aware, the wireless handset industry in the United States is dominated by several large manufacturers that work very closely with the four major wireless carriers. As a result, only two approaches exist for a third party service provider such as Progeny to convince a wireless handset manufacturer to make hardware and software changes to its products in order to accommodate a new service capability. First, the handset manufacturer must be convinced that the changes will enhance the desirability of its products to consumers as compared to competing handsets. Unfortunately, insufficient consumer awareness exists regarding the importance of wireless indoor location accuracy to make Progeny's location service a sales differentiator for handset manufacturers. Second, one of the major wireless carriers must ask or direct wireless handset manufacturers to include a new capability or specification in the handsets produced for that carrier.

Despite the very limited options that exist for a third party to secure the inclusion of a new capability in wireless handsets, Progeny has achieved significant success in securing MBS compatibility in handsets. As indicated in Progeny's confidential Progress Report, Progeny anticipates that wireless handsets that are compatible with its MBS location technology will be widely available on a retail basis in 2020. Given this progress, and the fact that the delays in securing MBS-compatible handsets resulted from factors beyond Progeny's control, the Commission should grant a 20 month extension of the deadline for Progeny to make MBS-compatible handsets commercially available in the United States.

[2] 47 C.F.R. § 1.946(e)(1).

II. A BRIEF EXTENSION OF THE COMPATIBLE HANDSET DEADLINE WILL NOT DELAY THE IMPLEMENTATION OF THE COMMISSION'S WIRELESS LOCATION REQUIREMENTS

As the Division acknowledged in its *Order*, the milestone schedule that was requested by Progeny (and adopted by the Division in its *Order*) was intended to coincide with the deadlines imposed by the Commission in its *Wireless Location Order*.[3] Specifically, Progeny estimated the approximate point in the implementation process when the major wireless carriers may need Progeny's MBS technology to comply with the Commission's wireless location rules in various CMAs and requested build out milestones that matched those estimates. In turn, the Division adopted new building out milestones for Progeny's M-LMS licenses that aligned with Progeny's request.

The only exception was with respect to the Division's requirement that Progeny make MBS-compatible handsets available in the United States by April 2, 2019.[4] This condition was not requested by Progeny and did not align with any of the implementation deadlines that were adopted by the Commission in its *Wireless Location Order*.

Progeny did not object to the handset condition when it was issued because Progeny hoped at the time that it could satisfy the deadline. As discussed in the previous section of this request, however, Progeny could not act unilaterally in causing its technology to be included in wireless handsets. Despite this fact, Progeny has made substantial progress in securing the inclusion of

[3] *Order*, ¶ 16 (acknowledging that Progeny's waiver request, as amended, seeks "an extension of the second construction deadlines for all of the Licenses to coincide with the timelines set forth in the Commission's *Indoor Location Accuracy Order*").

[4] *See id.*, ¶ 35.

MBS technology in wireless handsets and, absent unforeseen circumstances, the technology will be available in handsets that are commercially available in 2020.

More importantly, Progeny's inability to satisfy this condition by April 2, 2019 will not cause a delay in the implementation of the wireless location rules that the Commission adopted in 2015. The first of the wireless location deadlines that is likely to necessitate the use of Progeny's MBS technology is the requirement that the major carriers make available calibrated z-axis information for wireless callers to E911 in the top 25 CMAs by April 2021. Even if MBS-compatible handsets do not become available until the second half of 2020, their availability will still pre-date the Commission's deadline. Therefore, a brief extension of the handset condition for Progeny's MBS technology will not delay the wireless location compliance process. The Commission should therefore grant a 20 month extension of the MBS-compatible handset requirement.

III. THE GRANT OF A WAIVER OF THE HANDSET DEADLINE IS JUSTIFIED BY THE SUBSTANTIAL PUBIC INTEREST BENEFITS OF PROGENY'S MBS INDOOR LOCATION SERVICE

Pursuant to Section 1.925 of the Commission's rules, the Commission may grant a waiver of its rules if it is shown that the underlying purpose of the rule would not be served and granting a waiver would be in the public interest, or that application of the rule would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.[5] In this case, substantial public interest benefits would result by granting Progeny a waiver of the condition that MBS-compatible handsets be commercially available by April 2, 2019. These benefits will be realized in several different ways, including providing highly accurate horizontal

[5] 47 C.F.R. § 1.925.

and vertical location services to support E911, providing situational awareness information to public safety regarding the physical locations of first responders in complex emergency response situations, and providing an independent and highly reliable backup to GPS timing and positioning signals.

A. Progeny's MBS Technology will Provide Highly Accurate Horizontal Location Information to Support Wireless E911 Emergency Response

The substantial public interest benefits that would result from waiving the deadline for Progeny to make available MBS-compatible handsets was clearly articulated in the Division's *Order* that established the handset deadline, acknowledging that "the record clearly demonstrates that Progeny's network holds the potential of offering significant public safety benefits through improved E911 indoor location accuracy."[6]

The Commission has repeatedly confirmed, including as recently as two weeks ago,[7] that improved indoor wireless location accuracy is a critical public safety need.[8] In 2018, the number of Americans with smartphones rose to 77 percent, up from just 35 percent in 2011.[9] The steadily increasing prevalence of wireless phones "increases the likelihood that wireless 911 calls will

[6] *See Order*, ¶ 28 (*citing* Wireless E911 Location Accuracy Order, PS Docket No. 07-114, *Fourth Report and Order*, 30 FCC Rcd 1259 (2015) ("*Location Accuracy Order*")).

[7] *See* Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114, *Fourth Further Notice of Proposed Rulemaking*, FCC 19-20 (March 18, 2020) ("*Z-axis Notice*").

[8] Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114, *Third Report and Order, and Second Further Notice of Proposed Rulemaking*, 26 FCC Rcd 10074 (2011) (noting that effective E911 operation "requires development of indoor technical solutions").

[9] Pew Research Center, Internet and Technology, *Mobile Device Report* (Feb. 5, 2018), *available at* http://www.pewinternet.org/fact-sheet/mobile/ (*last visited* March 20, 2019).

come from indoor environments where traditional location accuracy technologies optimized for outdoor calling often do not work effectively or at all."[10] As a result, the limitations of current indoor location accuracy have become much more evident.[11] Based on the record, the Commission has unequivocally concluded that "[t]his gap in the performance of 911 location service needs to be closed: the public rightfully expects 911 location technologies to work effectively regardless of whether a 911 call originates indoors or outdoors."[12]

The ultimate goal for horizontal location capabilities in indoor locations was specifically addressed by the public safety community in its Foreword to the Commission's CSRIC Test Bed Report.[13] Ideally, public safety seeks the identification of a "specific dispatchable building (and floor in multi-story environments)."[14] Quantifying this requirement, the public safety community explained

> [h]orizontal positional fixes that substantially exceed 50 meter accuracy, provides only general location information. Tighter performance is required, particularly in urban and dense urban

[10] *Location Accuracy Order,* ¶ 2; Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114, *Further Notice of Proposed Rulemaking*, FCC 14-13, ¶¶ 22, 28 (Feb. 21, 2014) ("*2014 FNPRM*").

[11] *2014 FNPRM*, ¶ 31 (noting that "indoor locations pose particular challenges for first responders in finding the caller" because "indoor incidents are often not visible to the first responder, and a city block in an urban environment could potentially contain thousands of apartments").

[12] *Location Accuracy Order,* ¶ 2.

[13] *See Indoor Location Test Bed Report,* The Communications Security, Reliability and Interoperability Council III, Working Group 3 – E9-1-1 Location Accuracy, at 9 (March 14, 2013) ("*CSRIC Test Bed Report*").

[14] *Id.*

> environments to narrow the search ring to a single building or a more reasonable number of adjacent buildings.[15]

Progeny's indoor location technology MBS has consistently proven its ability to meet the 50 meter objective for 80 percent of calls in industry-wide testing. Further, as Progeny's sister company, NextNav, explained in a report that it filed with the Commission on August 14, 2013,[16] subsequent enhancements to MBS technology consistently surpassed public safety's goal of at least 50 meter accuracy. Progeny's MBS technology is also resilient, with an ability to provide critically needed services even during power disruptions, storms and in other challenging environments.

Therefore, in order for the Commission to ensure that it can achieve its "ultimate objective" of ubiquitous, reliable, and accurate location technology for all Americans, it must ensure that the necessary technology is available to wireless carriers when the deadline for implementing this objective triggers. The grant of a waiver and brief extension of the Division's MBS-compatible handset requirement will achieve this objective by ensuring the continued availability of Progeny's technology without resulting in a delay in the implementation of the Commission's wireless location rules for wireless carriers.

---

[15] *Id.*

[16] *See* NextNav, LLC, Ex Parte Letter, WT Docket No. 07-114 (Aug. 14, 2013) ("*NextNav Aug. 14, 2013 Ex Parte*").

B. Progeny's MBS Technology will Provide Highly Accurate Vertical Location Information to Support Wireless E911 Emergency Response

Just two weeks ago, the Commission proposed the adoption of a vertical location metric of 3 meters for 80 percent of wireless calls to E911.[17] The Commission explained that this requirement is necessary "[t]o ensure that first responders and public safety answering points ("PSAPs") can find 911 callers quickly and accurately when a consumer calls from a multi-story building."[18] The Commission observed that its proposed 3 meter metric "will more accurately identify the floor level for most 911 calls, reduce emergency response times, and save lives."[19]

The Commission's *Z-axis Notice* also acknowledged that Progeny, through its sister company, NextNav, is the only vendor that has demonstrated thus far that its vertical location technology can consistently meet the 3 meter requirement. As the Commission explained, the results of the recently conducted z-axis test bed showed that

- In 80% of NextNav test calls, vertical location was identified to a range of 1.8 meters or less.[20]
- NextNav achieved a vertical accuracy within 2 meters for 67% of test calls and within 3 meters for 90% of test calls in the dense urban, urban, and suburban morphologies.[21]

---

[17] *See Z-axis Notice*, ¶ 11.

[18] *Id.*, ¶ 2.

[19] *Id.*

[20] *Id.*, ¶ 16 (*citing* 9-1-1 Location Technologies Test Bed, LLC, Report on Stage Z, PS Docket No. 70-114, at 65, 120 (2018) *available at* https://www.fcc.gov/ecfs/filing/10803074728956 (*last visited* March 20, 2019) ("*Report*")).

[21] *Id.* (*citing Report* at 65, 127).

- NextNav also achieved a vertical accuracy within 2 meters for 80% of test calls for every handset tested.[22]

The z-axis test bed results were entirely consistent with vertical location capabilities that have been demonstrated by Progeny in multiple prior test beds. Progeny first demonstrated its capabilities six years ago in the San Francisco Bay Area as part of the Commission's CSRIC III advisory council's industry-wide independent testing program for E911 indoor location technologies.[23] The wireless carriers subsequently provided Progeny the opportunity to demonstrate the significant vertical location capabilities of its MBS technology a second time during the Stage 2 test bed that was held in the fall of 2016. The independent test bed administrator indicated that the MBS technology was accurate within 1.7 meters across the three morphologies tested.[24]

Progeny has consistently demonstrated that its technology can achieve the specific requirements that the Commission has identified as necessary in its *Z-axis Notice*. The public interest would therefore be advanced significantly by granting Progeny's a brief extension of its handset-compatibility condition in order to ensure that Progeny's z-axis capabilities remain available for use by wireless carriers and emergency first responders.

---

[22] *Id.* (*citing Report* at 66).

[23] *See* CSRIC III WG3, Indoor Location Test Bed Report, at 8-9 (Mar. 14, 2013), *available at* http://transition.fcc.gov/bureaus/pshs/advisory/csric3/CSRIC_III_WG3_Report_March_%20201 3_ILTestBedReport.pdf (*last visited* Sept. 18, 2018).

[24] *See Report* at 126.

C. Progeny's MBS Location Technology may also Benefit Emergency First Responders on FirstNet

As AT&T recently acknowledged to the Commission, AT&T plans to offer floor-level z-axis location services to first responders through its FirstNet network."[25] AT&T officials have indicated that this capability should be available in its FirstNet network by 2020.[26] Progeny is working with AT&T on the possibility of using Progeny's technology for this purpose.

The use of Progeny's indoor location capabilities to support FirstNet would greatly benefit the safety and efficiency of emergency response operations. As the International Association of Fire Fighters ("IAFF") recently explained, "[t]ime-consuming room to room searches to locate a downed firefighter jeopardize the safety of both the fire fighter in need of assistance and those engaged in the search. . . . Incidents in which fire fighters have been injured or killed regularly have an unfailing theme—being unable to communicate accurate location information."[27]

It is unquestionably important to protect both the public and the public safety officials that come to their aid. As the IAFF explained, "[t]o effectively protect the public, we must also protect the fire fighters and paramedics with a duty to respond. In both cases, the provision of reliable and accurate vertical floor level information is necessary to locate wireless callers in distress and

---

[25] Reply Comments of AT&T, PS Docket No. 07-114, at 5 (Oct. 11, 2018).

[26] *See* Testimony of Chris Sambar, Senior Vice President, AT&T FirstNet, before the Senate Commerce, Science, and Transportation Committee's Communications, Technology, Innovation, and the Internet Subcommittee, Hearing on the Deployment of FirstNet, a National Public Safety Network for First Responders July 20, 2017, *available at* https://www.c-span.org/video/?431573-1/senators-receive-update-emergency-response-broadband-network (statement at 1:07:45 in recording) (*last visited* March 25, 2019).

[27] Comments of the International Association of Fire Fighters, PS Docket No. 07-114, at unnumbered page 1 (Oct. 1, 2018).

to ensure the safety of those dispatched to aide them." [28] A brief extension of Progeny's handset condition would further this goal by giving Progeny additional time to make MBS-compatible handsets commercially available, while not delaying the introduction and use of Progeny's MBS technology to assist public safety or the needs of the public.

D. Progeny's MBS Technology Could also Benefit the U.S. Government as a Backup to GPS Position, Navigation and Timing

Progeny's MBS technology includes an atomic timing reference housed within each of its beacon transmitters to ensure that all transmissions are synchronized to nanosecond level precision between transmitters. As a result, MBS can provide very high precision position, navigation and timing in the absence of GPS to other networks (*e.g.*, telecommunications, financial, *etc.*) and end user devices seamlessly and using a very low cost receiver.

The U.S. government has identified GPS resiliency as a critical national security vulnerability, observing in a Presidential Directive that "the Global Positioning System has grown into a global utility whose multi-use services are integral to U.S. national security, economic growth, transportation safety, and homeland security, and are an essential element of the worldwide economic infrastructure."[29] The Directive instructs the Department of Transportation, in coordination with the Department of Homeland Security ("DHS"), to "develop, acquire, operate, and maintain backup position, navigation, and timing capabilities that can support critical transportation, homeland security, and other critical civil and commercial infrastructure

---

[28] *Id.*

[29] National Security Presidential Directive-39, U.S. Space-Based Position, Navigation, and Timing Policy (Dec. 15, 2004), *available at* https://fas.org/irp/offdocs/nspd/nspd-39.htm (*last visited* March 20, 2019).

applications within the United States, in the event of a disruption of the Global Positioning System or other space-based positioning, navigation, and timing services."[30]

More recently, Congress adopted in the 2018 National Defense Authorization Act a requirement for the completion of studies and the development of a plan "for carrying out a backup GPS capability demonstration."[31] In accordance with this directive, DHS conducted an initial signal assessment test at NASA's Langley Research Center in Hampton, Virginia in December 2018. Progeny's MBS technology was included in this assessment. The outcome of the tests and a report on the options for GPS backup is expected to be submitted to Congress. Progeny anticipates that its MBS technology will be included in the report as an option for consideration.

Here again, the use of Progeny's MBS technology as a potential backup to GPS, particularly in urban locations where GPS reception is challenged, would provide important public interest benefits in terms of public safety and security, along with resiliency for position, navigation and timing systems used in such fields as transportation, finance, automation, commerce, and communications.[32] The Commission should therefore ensure that Progeny's MBS technology remains available for use by public safety and the U.S. federal government by granting

[30] *Id.*

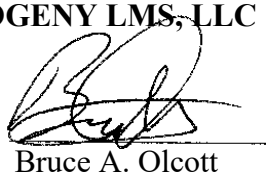
[31] National Defense Authorization Act for Fiscal Year 2018, Pub. L. 115-91, 131 Stat. 1283, 1725, Sec. 1606.

[32] With respect to communications infrastructure, the protection of wireless carrier networks from GPS outage vulnerabilities was the prime focus of a CSRIC effort (CSRIC V, Working Group 4 – Communications Infrastructure Resiliency Subgroup B, Network Timing Single Source Risk Reduction). The CSRIC V working group studied numerous approaches to providing carrier network resiliency in the face of compromised GPS signals, and MBS networks were identified as one of the potential solutions.

a waiver and brief extension of the deadline for Progeny to make MBS-compatible handsets available on a commercial basis.

Respectfully submitted,

PROGENY LMS, LLC

By: 

Bruce A. Olcott
Jones Day
51 Louisiana Ave NW
Washington, D.C. 20001
(202) 879-3630

Its Attorneys

April 2, 2019